What is claimed is:

1. A method for processing a plasma processing apparatus having a plasma generating means for generating plasma within a processing chamber, a high-frequency power applying means for applying high-frequency power to an object to be processed, a processing chamber to which an evacuating device is connected and capable of having its interior evacuated, and a gas supply device for the processing chamber, said method comprising:

mounting a Si wafer on an electrode for holding the object to be processed, introducing hydrobromic gas and chlorine gas into the processing chamber and generating plasma, and removing an aluminum-based deposit adhered to the interior of the processing chamber.

2. The method for processing a plasma processing apparatus according to claim 1, further comprising applying a high-frequency power to the Si wafer on the electrode for holding the object to be processed to remove the aluminum-based deposit adhered to the interior of the processing chamber.

3. A plasma processing method for generating a plasma in a vacuum container and processing a substrate placed on a substrate holder disposed within the vacuum container, comprising:

providing a period for generating plasma containing a halogen gas excluding fluorine and an element that reacts with fluorine to create a gas-phase reaction product either each time

after processing a wafer or before and/or after processing plural wafers.

4. A plasma processing method for generating a plasma in a vacuum container and processing a substrate placed on a substrate holder disposed within the vacuum container, comprising

providing a period for generating plasma containing a halogen gas excluding fluorine and a Si element either each time after processing a wafer or before and/or after processing plural wafers.

5. The plasma processing method according to claim 3 or claim 4, wherein

a portion of a material constituting the vacuum container contains Al or a stable compound of Al, and a gas containing fluorine is used as gas for processing the wafer with plasma.

6. The plasma processing method according to any one of claims 3 through 5, wherein

the halogen gas excluding fluorine contains either Cl atoms or Br atoms, or both.

7. The plasma processing method according to any one of claims 3 through 5, wherein

the halogen gas excluding fluorine contains either Cl atoms or Br atoms, or both, and

the gas plasma being generated contains any one of or a combination of Cl_2, HCl, HBr, BCl_3 and ClF_3.

8. The plasma processing method according to any one of claims 3 through 7, wherein

a method for supplying Si atoms comprises placing a Si wafer, especially a Si wafer with no patterns printed thereon, on the substrate holder when the halogen plasma is discharged, and applying high-frequency power to the Si wafer through the substrate holder.

9. The plasma processing method according to any one of claims 3 through 7, wherein

a method for supplying Si atoms comprises placing a Si wafer, especially a Si wafer with no patterns printed thereon, on the substrate holder when the halogen plasma is discharged, and applying high-frequency power to the Si wafer through the substrate holder, wherein the high-frequency power being applied corresponds to a frequency of 400 kHz and is equal to or greater than 0.028 W per unit area (1 cm^2) of the Si wafer, and preferably equal to or greater than 0.11 W.

10. The plasma processing method according to any one of claims 3 through 9, wherein

a ratio of an area of an earth to the area of an inner wall of the vacuum container in contact with plasma is 40 % or more.

11. The plasma processing method according to claim 4, wherein Si atoms are supplied by including Si to a portion of a material constituting the vacuum container.

12. The plasma processing method according to claim 4, wherein Si atoms are provided by supplying $SiCl_4$ gas.

13. The plasma processing method according to claim 3, wherein the element that reacts with fluorine to create a gas-phase reaction product is provided by supplying N_2, CO, CO_2, H_2 or SO_2 simultaneously with the halogen gas excluding fluorine.

14. The plasma processing method according to any one of claims 3 through 13, further comprising:

providing a period for generating plasma containing SF_6 prior to said period for generating plasma with the halogen gas excluding fluorine.